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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/517,667

12/13/2004

Kenji Ishii

Q84706

1902

23373

7590

09/25/2006

EXAMINER

PUTTLITZ, KARL J

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WASHINGTON, DC 20037

ART UNIT

PAPER NUMBER

1621

DATE MAILED: 09/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary  
for Applications  
Under Accelerated Examination**

Application No.

10/517,667

Applicant(s)

ISHII ET AL.

Examiner

Karl J. Puttlitz

Art Unit

1621

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Since this application has been granted special status under the accelerated examination program,**  
**NO extensions of time under 37 CFR 1.136(a) will be permitted and a SHORTENED STATUTORY PERIOD FOR**  
**REPLY IS SET TO EXPIRE:**

**ONE MONTH OR THIRTY (30) DAYS, WHICHEVER IS LONGER,**  
**FROM THE MAILING DATE OF THIS COMMUNICATION – if this is a non-final action or a *Quayle* action.**  
**(Examiner: For FINAL actions, please use PTOL-326.)**

The objective of the accelerated examination program is to complete the examination of an application within twelve months from the filing date of the application. Any reply must be filed electronically via EFS-Web so that the papers will be expeditiously processed and considered. If the reply is not filed electronically via EFS-Web, the final disposition of the application may occur later than twelve months from the filing of the application.

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2006.  
2) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 3) ☒ Claim(s) 1-19 is/are pending in the application.  
3a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
4) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
5) ☒ Claim(s) 1-19 is/are rejected.  
6) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
7) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 8) ☐ The specification is objected to by the Examiner.  
9) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
10) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 11) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 6/28/2006  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

The examiner appreciates the cross reference to the counterpart PCT application.

The objection to the Oath is withdrawn in view of Applicant's remarks.

The rejection under section 112, second paragraph is withdrawn in view of the amendments clarifying the definitions of Y<sup>1</sup> and Y<sup>2</sup>.

The rejection under section 103 is maintained and repeated below. Applicant's remarks in connection with this ground of rejection are also addressed.

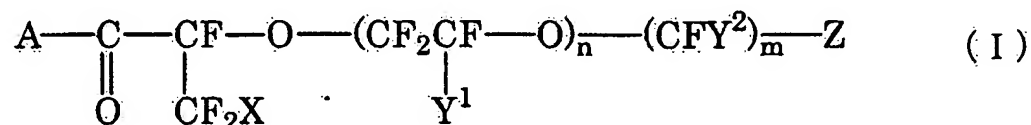
### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,649,790 to Tatemoto (Tatemoto).

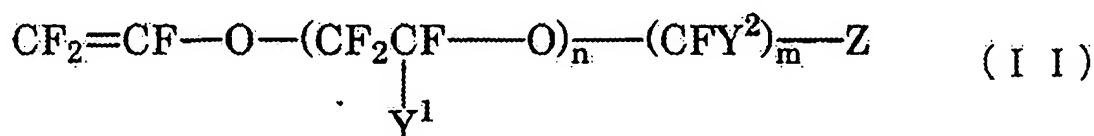
The rejected claims cover a method for producing a water-soluble fluorine-containing vinyl ether which comprises subjecting a fluorine-containing 2-alkoxypropionic acid derivative represented by the following general formula (I):



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[see definitions in claim 1]

to thermal decomposition at a temperature of not lower than 50°C but lower than 170°C in the presence of a coordinating organic solvent to give a water-soluble fluorine-containing vinyl ether represented by the following general formula (II):



[see definitions in claim 1]

said coordinating organic solvent having a coordinating property with an ion of said M<sup>1</sup> or an ion of said M<sup>2</sup> and said coordinating organic solvent being in an amount of 10 to 1,000 parts by mass per 100 parts by mass of said fluorine-containing 2-alkoxypropionic acid derivative.

The rejected claims also cover those embodiments specifying the wherein the hydrophilic group.

The rejected claims also cover those embodiments the thermal decomposition is carried out at a temperature not lower than 50°C but lower than 150°C.

The rejected claims also cover those embodiments wherein the coordinating organic solvent is in an amount of 30 to 300 parts by mass per 100 parts by mass of the fluorine-containing 2-alkoxypropionic acid derivative.

The rejected claims also cover those embodiments wherein the coordinating organic solvent comprises an aprotic polar organic solvent; and wherein the aprotic polar organic solvent is an ether solvent, sulfolane, hexamethylphosphoric triamide, acetonitrile, dimethylformamide, dimethyl sulfoxide, ethyl acetate and/or tetramethylurea; and wherein the ether solvent is a glyme-based solvent, a diethyl ether, a diisopropyl ether, tetrahydrofuran, dioxane, anisole and/or a crown ether. The glyme-based solvent is dimethoxyethane, diethoxyethane, monoethylene glycol dimethyl ether, diethylene glycol dimethyl ether, triethylene glycol dimethyl ether, tetraethylene glycol dimethyl ether, diethylene glycol monomethyl ether and/or diethylene glycol monoethyl ether. The aprotic polar organic solvent is a glyme-based solvent.

The rejected claims also cover those embodiments wherein the aprotic polar organic solvent has a water content not exceeding 250 ppm.

The rejected claims also cover those embodiments wherein the aprotic polar organic solvent is diethylene glycol dimethyl ether; and wherein the diethylene glycol dimethyl ether has a water content not exceeding 250 ppm.

The rejected claims also cover those embodiments wherein the fluorine-containing 2-alkoxypropionic acid derivative represented by the general formula (I) has a water content not exceeding 0.1% by mass.

The rejected claims also cover those embodiments wherein  $n$  is 0 or 1.

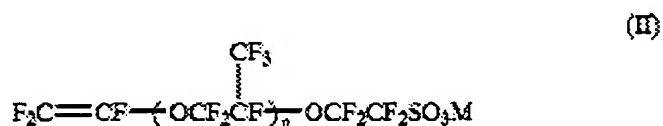
The rejected claims also cover those embodiments wherein  $Z$  is  $-\text{SO}_3\text{M}^3$  or  $-\text{SO}_3\text{M}^{4}_{1/2}$ .

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The rejected claims also cover those embodiments specifying Z and wherein Y<sup>1</sup> is a trifluoromethyl group, Y<sup>2</sup> is a fluorine atom and m is 2.

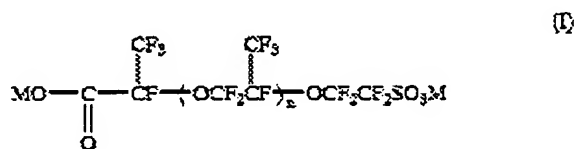
The rejected claims also cover those embodiments wherein n is 0.

With regard to the above embodiments, Tatemoto teaches a process for preparing a perfluorovinylethersulfonic acid derivative represented by formula (II):



[wherein M represents an alkali metal or alkaline earth metal; and n is 0, 1 or 2.]

by pyrolysis of a compound represented by formula (I) below:



[wherein M and n are as defined above], the pyrolysis being conducted in the presence of a catalyst which has coordinating properties to a metal ion M. See column 2, lines 19-40.

Specifically, the catalyst which has coordinating properties to a metal ion M is a glyme-based compound. In particular, the glyme-based compound is diethylene glycol dimethyl ether. See description bridging columns 2 and 3. In this same regard, the catalyst which has coordinating properties to a metal ion M is added in an amount of about 0.1 to about 1000 parts by weight relative to 100 parts by weight of a starting compound represented by formula (I). See column 3, lines 7-15.

Tatemoto teaches that pyrolysis is conducted generally at about 100°C or higher. See column 4, lines 30-35. Tatemoto does not indicate that water is present (see claims 12 and 13).

The difference between the process set forth in the rejected claims and the process set forth in the instant claims is that while the instant claims require that the organic solvent be coordinating with regard to the metal "M", Tatemoto teaches that the coordinating component is a catalyst. However, as mentioned above, Tatemoto teaches that these components are the same, i.e., a glyme-based compound, in particular, diethylene glycol dimethyl ether. Moreover, the amounts of the coordinating component are the same: Tatemoto teaches amounts of 0.1 to about 1000 parts by weight relative to 100 parts by weight of a starting compound while the instant claims require 30 to 300 parts by mass per 100 parts by mass of the fluorine-containing 2-alkoxypropionic acid derivative. Therefore, notwithstanding the fact that Tatemoto teaches additional solvents not required by the claims, the disclosed coordinating components are the same, despite being a solvent or catalyst. In this connection, the claimed requirement that the organic solvent be coordinating with regard to the metal "M" is well within the motivation of those of ordinary skill, based on Tatemoto. Accordingly, the rejected claims are prima facie obvious in view of Tatemoto since this reference teaches the elements of the rejected claims with a reasonable expectation of success.

Applicant argues that the present invention constitutes an advance in the art by further reducing generation of by-products, wherein reaction temperature are controlled. The method of this invention is conducted in the presence of a coordinating organic solvent. By using the coordinating organic solvent, the present invention can produce the intended compound in good yield and inhibit the generation of by-products. Further, in the present invention, thermal decomposition is conducted at a temperature of not lower than 50 C but lower than 170 C. Namely, when the reaction is carried out at temperatures not lower than 170 C, by-products tend to form in large amount. Thus, one advantage of the invention is to inhibit the generation of by-products while also conducting the reaction at the temperature within the range mentioned above.

However, as mentioned above, Tatemoto teaches that these components are the same, i.e., a glyme-based compound, in particular, diethylene glycol dimethyl ether. Moreover, the amounts of the coordinating component are the same: Tatemoto teaches amounts of 0.1 to about 1000 parts by weight relative to 100 parts by weight of a starting compound while the instant claims require 30 to 300 parts by mass per 100 parts by mass of the fluorine-containing 2-alkoxypropionic acid derivative. Thus the kind and amounts of catalyst used in Tatemoto and the kind and amounts of solvent used in the instant invention are the same. Moreover, the reference explicitly teaches that the glyme-based catalysts may also act as solvents, see column 4, lines 1-6. Therefore, the catalysts/solvents of the claims are prima facie obvious.



With regard to the temperature requirements, Tatemoto teaches that pyrolysis is conducted generally at about 100°C or higher. See column 4, lines 30-35. Therefore this element of the instant claims is also prima facie obvious.

With regard to the new claims, the glyme-based solvents read on the solvents required by claim 18. With regard to the solvents in claim 19, Tatemoto teaches that the process may use inert solvents, which is strongly suggestive of solvents such as tetrahydrofuran.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (571) 272-0645. The examiner can normally be reached on Monday to Friday from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman K. Page, can be reached at telephone number (571) 272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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